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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,230	12/16/2003	Leon Martin Levasier	081468-0307255	3133
909	7590	03/18/2005	EXAMINER	
PILLSBURY WINTHROP, LLP			NGUYEN, HUNG	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2851	

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/736,230

Applicant(s)

LEVASIER ET AL.

Examiner

Hung Henry V. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 49-56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 11, 12, 25-32, 35, 36, 47 and 48 is/are rejected.
- 7) ☒ Claim(s) 7-10, 13-24, 33-34, 36-46 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of group I (claims 1-48) in the reply filed on January 21, 2005 is acknowledged.

### ***Specification***

2. The disclosure is objected to because of the following informalities: The disclosure should be carefully reviewed and ensure that any and all grammatically, idiomatic, and spelling or other minor errors are corrected. For example, on page 28, third paragraph, reference to [000] should be --[00089], and page 42, paragraph [000129] line 4, reference to "a intensity" should be --an intensity--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6, 11-12, 25-32, and 35-36, 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiraishi (U.S.Pat. 5,801,390) in view of Arai et al (U.S.Pat. 6,388,341).

With respect to claims 1-6, 11-12, 25-32, 35-36 and 47-48, Shiraishi discloses a lithographic apparatus comprising: a support structure (RST) configured to hold a patterning structure, the patterning structure (R) being configured to pattern a beam of radiation according to a predetermined pattern; a substrate table (WST) configured to hold a substrate (W) including an alignment structure having spatially periodic optical properties (see col.38, lines 47-50, figure 3 and col.49, lines 29-30) and an alignment subsystems (100, 110, 120) configured to align the substrate relative to the patterning structure, the alignment subsystem comprising: optics configured to process light affected by the alignment structure to produce measurement light whose intensity varies with a position of the spatially periodic alignment structure relative to a reference position relating to a position of the patterning structure (see col.11, lines 14-56) and a sensor configured to measure at least one among intensity information/light quantity of the measurement light and phase information of the measurement light (see col.49, lines 50-60). Shiraishi further teaches an actuator (21) for controlling a relative positions of the substrate table and the patterning structure in accordance with the measured information of the measuring light and the optics includes an optical interference arrangement (see col.24, lines 22-25) and the alignment subsystem is arranged to determine the position of from a spatial dependence of the intensity information of the measurement light (see figure 4, col.22 lines 57 thru col.23 line 45). Thus, Shiraishi discloses substantially all of the basic features of the instant claims including detection position of alignment structure having a repeating patterns of concavities and convexities. Shiraishi does not expressly disclose determining a position of a non-periodic feature of the alignment structure. However, this feature is well known in the art. For the purpose of improved positioning performance, Arai et al

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teaches an exposure device for aligning the substrate where alignment mark comprises a non-periodic pattern of the alignment structure (see figure 1, 5 and col. 11, lines 19-24 and line 55-56). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Shiraishi and Arai et al to obtain the invention as specified in the above claims. It would have been obvious to a skilled artisan to employ a non-periodic feature of the alignment structure as taught by Arai et al into the device of Shiraishi and detecting the position of the non-periodic feature of the alignment structure. The purpose of doing so would have been to combine the positional information of periodic pattern and non-periodic pattern whereby the alignment precision between the substrate and the patterning structure is enhanced and greatly improved.

***Allowable Subject Matter***

5. Claims 7-10, 13- 24, 33-34 and 36-46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record either alone or in combination, neither discloses nor makes obvious the combination of a lithographic apparatus and corresponding method comprising among other features, the non-periodic pattern having specified structure or the alignment structure satisfying conditions as recited in the mentioned claims of the present application.

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***Prior Art Made of Record***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nomura et al (U.S.Pat. 4,828,392) discloses a lithographic apparatus where a plurality of higher order sub-beams from the substrate mark are measured for aligning the substrate and wherein the alignment mark comprises an asymmetric alignment mark.


Bornebroek (U.S.Pat. 6,297,876) and Navarro Y Koren (U.S.Pat. 6,844,918) disclose lithographic projection apparatuses with an alignment system for aligning substrate and the mask.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V. Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

hvn  
3/10/05

  
**HENRY HUNG NGUYEN**  
**PRIMARY EXAMINER**